# Effect of Mesh Weight on Outcomes in Retromuscular Sugarbaker Repairs for Parastomal Hernias: An ACHQC Analysis

McKell Quattrone MD, Eric D. Moyer MD, Antionette Hu MD, Eric M. Pauli MD

Department of Surgery

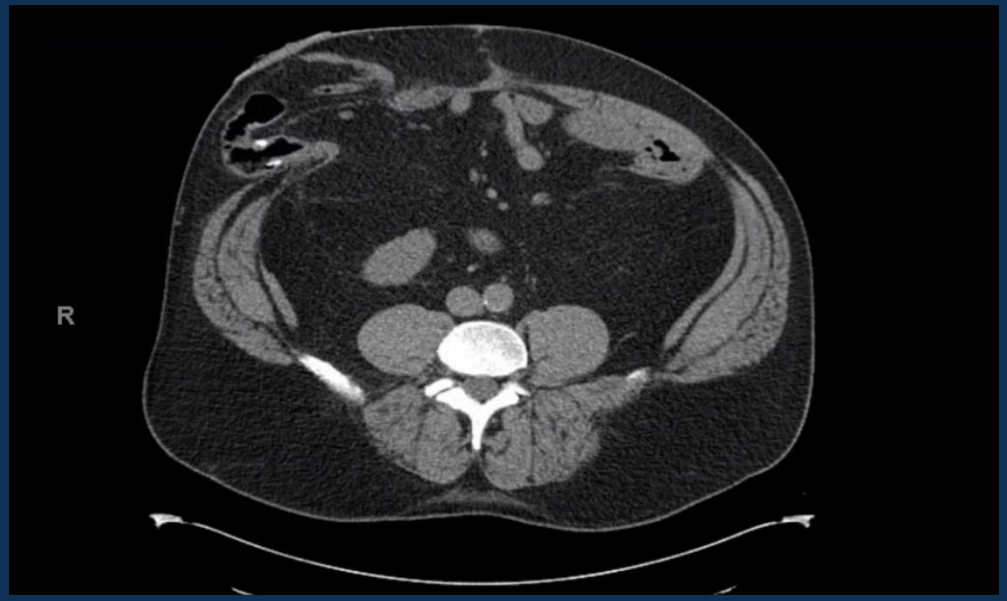
PennState Health
Milton S. Hershey Medical Center

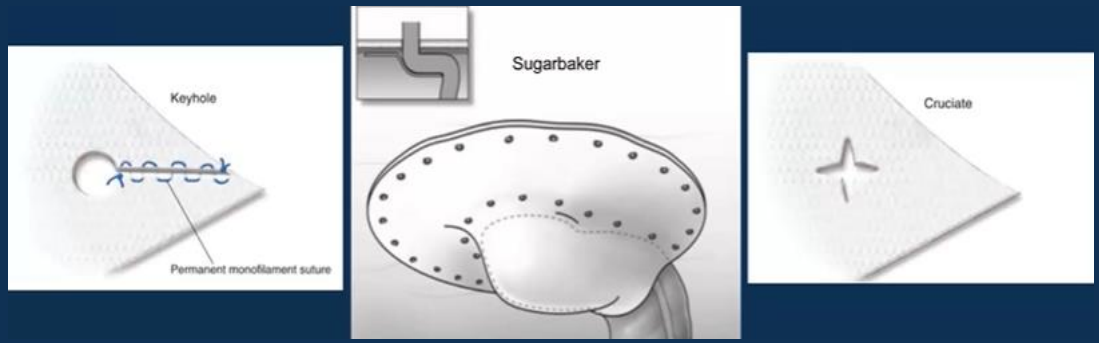
# Disclosures

- McKell Quattrone, MD-none
- Eric D. Moyer, MD-none
- Antionette Hu, MD-none
- Eric M. Pauli, MD FACS FASGE
  - Speaking/teaching: Becton-Dickinson, Medtronic
  - Consultant: Boston Scientific Corp., Actuated Biomedical, Inc., Cook Biotech, Neptune Medical, Surgimatix, Noah Medical, Allergan, Intuitive Surgical, ERBE, Integra, Steris, Vicarious Surgical, Telabio
  - Royalties: UpToDate, Inc., Springer
  - Financial Interests: IHC, Inc., Cranial Devices Inc, Actuated Medical

# Introduction

- Management of parastomal hernias remains complex
  - High inherent recurrence and complication rates
- Multitude of management options
  - No consensus for technique, mesh arrangement, or mesh type

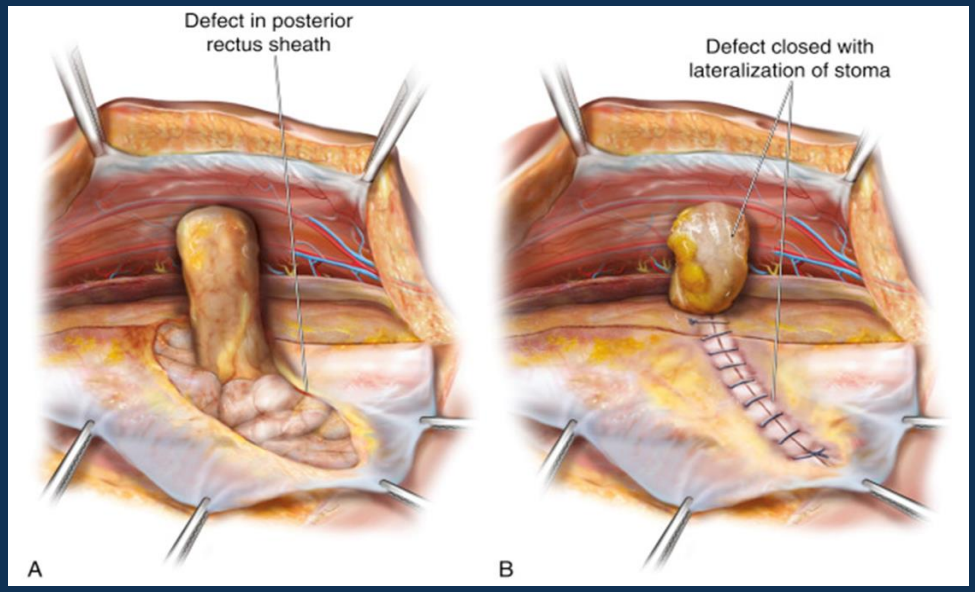


# Introduction

Pauli Parastomal Hernia Repair (PPHR):

- lateralization of stoma bowel in the retromuscular plane
- extraperitoneal placement of mesh in a Sugarbaker configuration




Winder JS, Pauli EM. Open parastomal hernia repair. In: Rosen MJ, editor. Atlas of abdominal wall reconstruction. 2nd Edition. Philadelphia: Elsevier; 2017. p. 124-49

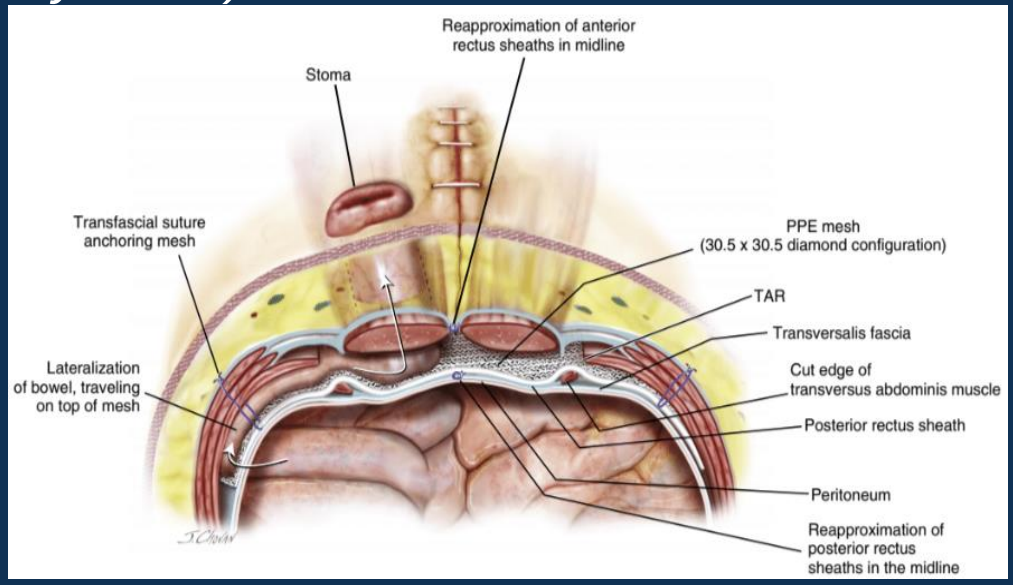
# Introduction

- Best mesh weight remains unstudied

- Lightweight mesh:
  - Risk of central mesh fracture and recurrence (Ebbehoj, AL et al. *Lap Surgery.* 2021*).*
  - Bridged repair near defect

- Heavyweight mesh:
  - Lower risk of recurrence
  - Infection risk
  - Risk of mesh erosion

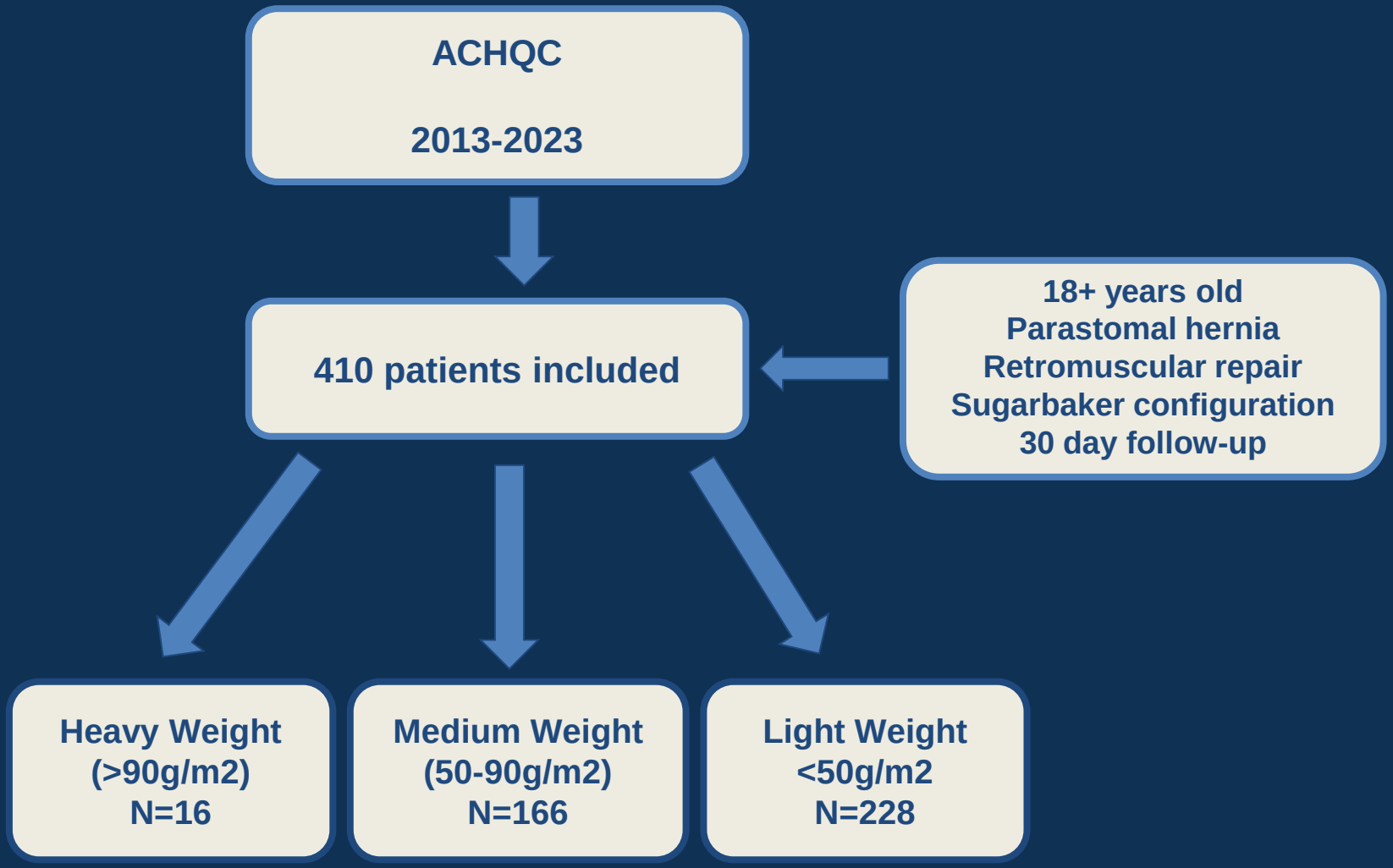
Ebbehoj, AL et al. Mesh fracture as a cause for recurrence in laparoscopic Sugarbaker parastomal hernia repair. *Lap Surgery.* 2021




Winder JS, Pauli EM. Open parastomal hernia repair. In: Rosen MJ, editor. Atlas of abdominal wall reconstruction. 2nd Edition. Philadelphia: Elsevier; 2017. p. 124-49

# Objectives

- Determine effect of mesh weight on outcomes following Retromuscular Modified Sugarbaker Repair (PPHR)
- Primary Outcome: Recurrence (30 day and 1 year)
- Secondary Outcomes:
  - SSO/I
  - Post-operative complications
  - Readmission
  - Postoperative pain scores


ACHQC
2013-2023
410 patients included
18+ years old
Parastomal hernia
Retromuscular repair
Sugarbaker configuration
30 day follow-up
Heavy Weight
(>90g/m2)
N=16
Medium Weight
(50-90g/m2)
N=166
Light Weight
<50g/m2
N=228

# Results: Patient Demographics

| | Heavy (N=16) | Medium (N=166) | Light (N=228) | p-value |
|---|---|---|---|---|
| **Sex, % (n)** | | | | |
| Male | 38% (6) | 51% (84) | 50% (115) | 0.59 |
| Female | 62% (10) | 49% (82) | 50% (113) | |
| **Race, % (n)** | | | | |
| White | 93.8% (15) | 94.5% (155) | 93.4% (211) | |
| Black | 6.2% (1) | 3.1% (5) | 4.0% (9) | 0.99 |
| Asian/Pacific | 0% (0) | 0% (0) | 0.4% (1) | |
| Hispanic | 0% (0) | 1.2% (2) | 1.3% (3) | |
| Other | 0% (0) | 1.2% (2) | 0.9% (2) | |
| **Age, median (Q1-Q3)** | 64 (54-69) | 65 (56-74) | 63 (51-71) | 0.08 |
| **Current Smoker** | | | | |
| Yes | 6.2% (1) | 8.4% (14) | 6.6% (15) | 0.77 |
| No | 93.8% (15) | 91.6% (152) | 93.4% (213) | |
| **BMI, median (Q1-Q3)** | 32 (24-34) | 30 (27-34) | 33 (29-36) | 0.001 |
| **ASA Class, % (n)** | | | | |
| 2 | 25% (4) | 15% (25) | 18% (42) | 0.73 |
| 3 | 75% (12) | 83% (137) | 77% (176) | |
| 4 | 0% (0) | 2% (4) | 4% (9) | |

# Results: Hernia Characteristics

| | Heavy (N=16) | Medium (N=166) | Light (N=228) | p-value |
|---|---|---|---|---|
| Recurrent Hernia | 38% (6) | 40% (66) | 61% (138) | 0.001 |
| Hx Mesh Infection | 6.2 (1%) | 3.0% (5) | 1.8% (4) | 0.44 |
| Hernia width, median (Q1-Q3) | 8.0 (3.5-17.5) | 12.0 (10.0-15.0) | 15.0 (12.0-18.0) | <0.001 |
| Hernia length, median (Q1-Q3) | 15.0 (5.5-20) | 19.0 (15.0-23.0) | 23.0 (18.0-25.0) | <0.001 |

# Results: Operative Details

| | Heavy (N=16) | Medium (N=166) | Light (N=228) | p-value |
|---|---|---|---|---|
| **Wound Class, % (n)** | | | | |
| **1** | 37.5% (6) | 13.9% (23) | 7.5% (17) | |
| **2** | 62.5% (10) | 51.8% (86) | 62.3% (142) | 0.001 |
| **3** | 0% (0) | 33.7% (56) | 29.0% (66) | |
| **4** | 0% (0) | 0.6% (1) | 1.3% (3) | |
| **Operative Time (minutes)** | | | | |
| **60-119** | 0.0% (0) | 4.8% (8) | 0.0% (0) | |
| **120-179** | 18.8% (3) | 13.9% (23) | 13.2% (30) | 0.002 |
| **180-239** | 25.0% (4) | 31.9% (53) | 21.1% (48) | |
| **240+** | 56.2% (9) | 65.8% (150) | 49.4% (82) | |
| **Elective** | 100% (16) | 99.4 (165) | 98.2% (224) | 0.53 |
| **Transversus abdominis release** | 81% (13) | 98.2 (163) | 98.2% (224) | 0.37 |
| **Mesh width, median (Q1-Q3)** | 25 (18-32) | 30 (30-30) | 30 (30-50) | <0.001 |
| **Mesh length, median (Q1-Q3)** | 28 (24-31) | 31 (30-45) | 30 (30-34) | <0.001 |
| **Mesh fixation** | 69% (11) | 37% (62) | 54% (122) | 0.001 |

# Results: Postoperative Outcomes

| | Heavy (N=16) | Medium (N=166) | Light (N=228) | p-value |
|---|---|---|---|---|
| Readmission <30d | 18.8% (3) | 8.4% (14) | 10.5% (24) | 0.39 |
| Ileus | 12.5% (2) | 26.5% (44) | 23.7% (54) | 0.67 |
| Bowel Obstruction | 0.0 % (0) | 1.8% (3) | 1.8% (4) | 0.91 |
| In-hospital complications | | | | |
| Sepsis | 0.0% (0) | 0.6% (1) | 0.9% (2) | 0.9 |
| UTI | 0.0% (0) | 3.0% (5) | 1.8% (4) | 0.58 |
| Pneumonia | 0.0% (0) | 1.2% (2) | 0.0% (0) | 0.23 |
| DVT | 0.0% (0) | 1.2% (2) | 2.2% (5) | 0.65 |
| PE | 0.0% (0) | 0.6% (1) | 1.3% (3) | 0.71 |
| MI | 0.0% (0) | 1.2% (2) | 0.44% (1) | 0.64 |
| Acute renal failure | 0.0% (0) | 1.2% (2) | 0.88% (2) | 0.87 |
| Intubation | 0.0% (0) | 0.6% (1) | 2.2% (5) | 0.38 |
| Other | 6.2% (1) | 4.8% (8) | 2.6% (6) | 0.45 |

| | Heavy (N=16) | Medium (N=166) | Light (N=228) | p-value |
|---|---|---|---|---|
| SSI | 6.2% (1) | 9.6% (16) | 13.2% (30) | 0.45 |
| Superficial | 6.2% (1) | 6.6% (11) | 7.4% (17) | 0.53 |
| Deep | 0% (0) | 1.8% (3) | 4.8% (11) | 0.36 |
| Organ space | 0% (0) | 1.2% (2) | 0.4% (1) | 0.65 |
| SSO | 6.2% (1) | 9.6% (16) | 13.2% (30) | 0.2 |
| Seroma | 0.0% (0) | 1.8% (3) | 3.1% (7) | 0.66 |
| Hematoma | 0.0% (0) | 1.2% (2) | 1.8% (4) | 0.85 |
| Skin necrosis | 0.0% (0) | 0.6% (1) | 0.4% (1) | 0.95 |
| Other | 0.0% (0) | 6% % (10) | 7.0% (16) | |
| SSI/SSO Requiring Procedural Intervention | 6.2% (1) | 12.0% (20) | 12.7% (29) | 0.74 |
| Reoperation <30d | 6.2% (1) | 2.4% (4) | 4.4% (10) | 0.5 |
| Recurrence | 0.0% (0) | 0.0% (0) | 0.0% (0) | |
| Obstruction | 6.2% (1) | 1.2% (2) | 1.3% (3) | 0.35 |
| Wound Complication | 0.0% (0) | 0.6% (1) | 3.0% (7) | 0.17 |
| Viscus Injury | 0.0% (0) | 0.6% (1) | 0.0% (0) | 0.23 |
| Recurrence <30d | 0.0% (0) | 0.0% (0) | 0.44% (1) | 0.67 |
| Recurrence <1yr | 0.0% (0) | 0.0% (0) | 0.0% (0) | 0.85 |
| PROMIS 30d | 48 (40-53) | 49 (44-52) | 46 (40-54) | 0.81 |
| PROMIS 1yr | 49 (48-51) | 36 (31-46) | 31 (31-48) | 0.31 |

# Summary

- Greater lightweight mesh use in:
  - higher BMI
  - larger hernia size
  - recurrent hernias

- No difference in 30-day postoperative complications, recurrence rates or post-operative pain scores between mesh weights

# Conclusion

- No definitive consensus on best mesh weight for patients undergoing open
- Surgeon preference favor
  weight mesh

- Limitations:
  - Retrospective databas
  - Small number of heav
  - Limited number of pati w-up

- Ongoing, prospective study needed to further evaluate

# PennState Health
## Milton S. Hershey Medical Center